

CLAIMS:

1. A filtering membrane for separation of one substance from another substance, wherein at least one of said substances is a fluid, said membrane comprising:
 - a first film made from a polymer material;
 - a second film made from a polymer material;
 - a plurality of welding seams that connect said first film to said second film and form at least a first closed cell and a second closed cell, said first closed cell and said second closed cell being interconnected through said welding seams penetrable only to said one substance and not penetrable to said another substance;
 - said first closed cell having an inlet opening formed in said first film for the supply of said one substance and another substance into said first cell, said second closed cell having an output opening formed in said second film for discharge of said one substance penetrated into said second closed cell through said welding seams.
2. The filtering membrane of Claim 1, wherein said welding seams have a structure, which at least partially is an amorphous structure.
3. The filtering membrane of Claim 2, wherein said amorphous structure comprises more than 50% of said structure.
4. The filtering membrane of Claim 3, wherein said amorphous structure comprises 100% of said structure.
5. The filtering membrane of Claim 2, wherein at least one of said first film and said second film has crazes.

6. The filtering membrane of Claim 5, wherein said crazes are filled with a craze-filling material selected from a group consisting of a solid material, a liquid material, and a gaseous material.
7. The filtering membrane of Claim 6, wherein said craze-filling material is selected from a group consisting of a material for controlling dimensions of said crazes, a treating material for treating said one substance, a material for treating said another substance, and a material for treating both said first substance and said another substance.
8. The filtering membrane of Claim 7, wherein said liquid material is a material with a high coefficient of thermal expansion for expanding the volume of said crazes during said welding.
9. The filtering material of Claim 7, wherein said treating material is an electrically charged material.
10. The filtering membrane of Claim 5, wherein said amorphous structure comprises more than 50% of said structure.
11. The filtering membrane of Claim 10, wherein said amorphous structure comprises 100% of said structure.
12. The filtering membrane of Claim 2, wherein said polymer material of said first film and said polymer material of said second film may be selected from the same polymer materials and different polymer materials.
13. The filtering membrane of Claim 12, wherein said polymer material of said first film and said polymer material of said second film are thermoplastic polymer material.

14. The filtering membrane of Claim 13, wherein said polymer material of said first film and said polymer material of said second film are different thermoplastic polymer materials and wherein said structure comprises a mixture of said polymer material of said first film and said polymer material of said second film.
15. The filtering membrane of Claim 13, wherein at least one of said first film and said second film has crazes.
16. The filtering membrane of Claim 15, wherein said crazes are filled with a craze-filling material selected from a group consisting of a solid material, a liquid material, and a gaseous material.
17. The filtering membrane of Claim 16, wherein said craze-filling material is selected from a group consisting of a material for controlling dimensions of said crazes, a treating material for treating said one substance, a material for treating said another substance, and a material for treating both said first substance and said another substance.
18. The filtering membrane of Claim 17, wherein said liquid material is a material with a high coefficient of thermal expansion for expanding the volume of said crazes during said welding.
19. The filtering membrane of Claim 17, wherein said treating material is an electrically charged material.
20. A method of manufacturing a filtering membrane comprising the steps of:
 - providing a first film made from a polymer material;
 - providing a second film made from a polymer material;
 - punching a plurality of first holes in said first film;

punching a plurality of second holes in said second film;

imposing said first film and said second film one onto the other so that said first holes do not coincide with said second holes;

welding said first film and said second film to each other by a plurality of intersecting welding seams which form a plurality of cells, wherein adjacent cells are separated by said intersecting welding seams and contain said first holes and said second holes arranged in an alternating order, so that one of said adjacent cells has one of said first holes while the other of said adjacent cells has one of said second holes.

21. The method of Claim 20, wherein said first holes and said second holes can be selected from a group consisting of inlet holes of said filtering membrane and outlet holes of said filtering membrane, so that in the case said first holes are inlet holes, then said second holes are outlet holes, and in the case said first holes are outlet holes, said second holes are inlet holes.

22. A method of manufacturing a filtering membrane comprising the steps of:

providing a first film made from a polymer material;

providing a second film made from a polymer material;

stretching at least one of said first film and said second film in a liquid surface-active medium until crazes of predetermined dimensions are formed;

punching a plurality of first holes in said first film;

punching a plurality of second holes in said second film;

imposing said first film and said second film one onto the other so that said first holes do not coincide with said second holes;

welding said first film and said second film to each other by a plurality of intersecting welding seams which form a plurality of cells, wherein adjacent cells are separated by said intersecting welding seams and contain said first holes and said second holes arranged in an alternating order, so that one of said adjacent

cells has one of said first holes while the other of said adjacent cells has one of said second holes.

23. The method of Claim 22, wherein said step of stretching further includes introduction of a filling substance into said crazes.

24. The method of Claim 23, providing the step of controlling dimensions of said crazes by subjecting said filling substance to thermal expansion.

25. The method of Claim 24, wherein said thermal expansion is carried out under the effect of welding.

2025-10-10 10:10:10